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PATENT  
Response

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

|              |                 |                 |                         |
|--------------|-----------------|-----------------|-------------------------|
| Applicant:   | Robert C. Beck  | Examiner:       | Desanto, M.             |
| Serial No.:  | 09/637,529      | Group Art Unit: | 3763                    |
| Filing Date: | August 10, 2000 | Docket No.:     | 2008                    |
| Title        | Catheter        |                 | RECEIVED<br>SEP 11 2002 |

Date of Deposit: 9/4/02

TECHNOLOGY CENTER R3700

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Signature: Robert C. Beck  
Printed Name: Robert C. Beck

SUPPLEMENTAL RESPONSE

Assistant Commissioner for Patents  
Washington, DC 20231

In response to the Office Action dated May 6, 2002, Applicant filed an Amendment which presented amended claims. Applicant failed to provide a copy marked to indicate the location of the changes, which is provided herewith.

Respectfully submitted,  
SPRITE SOLUTIONS  
By its attorneys:

Date: 9/4/02

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## VERSION SHOWING CHANGES

11. A catheter system comprising:

~~an ablation fluid supply~~ catheter having a catheter body said catheter body having a distal tip ~~said distal tip having a first maximal diameter;~~  
~~tip, said fluid supply~~ catheter having a fluid supply lumen and having at least one distal aperture for injecting fluid into a vessel; ~~said fluid supply lumen receiving fluid at a first supply rate; said distal aperture — a sheath having a internal diameter substantially equal to said first diameter of said ablation catheter; directing fluid so that a component of flow flows retrograde;~~  
~~a sheath having a distal tip and having an internal lumen for exhausting fluid and debris from a vessel at a second rate not determined exclusively by said first supply rate;~~

~~said ablation fluid supply~~ catheter located within said sheath and adapted for motion with respect to said sheath;

whereby ~~said ablation~~ catheter body can be moved independently of said sheath distal tip.

12. A catheter system according to claim ~~18~~11 wherein said internal diameter of said sheath is ~~slightly~~ larger than ~~said first~~the maximum diameter of ~~said ablation~~ catheter.

13. A catheter system according to claim ~~18~~11 wherein said internal diameter of said sheath is substantially equal to ~~said first~~the maximum diameter of ~~said ablation~~ catheter.

14. A catheter comprising:

a catheter body having a proximal end and having a distal end;

said catheter body defining an axis;

    said distal end having an approximately circular cross section;

    a ~~high pressure~~fluid injection lumen in said catheter body terminating near the distal end, for connection to a device for injecting fluid at a first rate;

an annular aperture encircling one or more apertures at the distal end of the catheter body, connecting the ~~high pressure~~fluid supply lumen with the exterior surface of said catheter body;

    said ~~annular~~ aperture defining a first ~~at last~~ one aperture direction for the emerging flow that lies between approximate ~~zero degrees and one hundred and eighty~~ ninety degrees and zero degrees, as measured from an axis along the catheter body,

    said ~~annular~~ aperture cooperating with said catheter body to direct ~~an annular sheet~~a flow of fluid emerging from said aperture along said catheter body such that fluid flows in a retrograde direction from said distal end ~~is substantially encircled with fluid from said aperture toward said proximal end.~~

15. The catheter of claim 2114 wherein said annular aperture is formed by a set of individual holes.

16. The catheter of claim 2215 wherein said set of individual holes are substantially equidistant around the periphery of said distal end of said catheter.

17. The catheter of claim 2316 wherein said holes are approximately round in cross section.

18. The catheter of claim 2316 wherein said holes are approximately rectangular in cross section.

19. The catheter of claim 2414 further including :

a control body surface located immediate adjacent said aperture, providing a barrier located proximate said aperture, for limiting fluid entrainment from the location of said control body, near the aperture by the jet emerging from the aperture, whereby said jet is deflected by a pressure difference across said barrier.

20. A catheter comprising:

a catheter body having a proximal end and having a distal end;  
a high pressure lumen located in said catheter body;  
a series of apertures communicating with said high pressure lumen;  
said series of aperture substantially completely encircling said distal end;  
a control body formed in said catheter body adjacent said series of apertures blocking fluid entrainment from the area proximal of said apertures by a jet emerging from said apertures.

21. The catheter device of claim 2619 wherein a tangent drawn to said control body surface at the location of the aperture is parallel to the aperture direction.

22. The catheter device of claim 2619 wherein a tangent drawn to said control body surface at the location of the aperture forms an included angle with the aperture direction that is greater than zero degrees and less than ninety degrees.

23. A extraction catheter system for removing embolic material comprising:

a sheath having a sheath lumen adapted to receive and guide a catheter;

said catheter having a catheter body having a distal end and a proximal end and

having an interior and an exterior surface;

a fluid supply lumen in said catheter body, for connection to a device for injecting

fluid at a first rate;

a fluid port connecting said fluid supply lumen with the exterior surface of said

catheter body;

said fluid port and said body cooperating to attach fluid ejected from said fluid port

to said body;

whereby said fluid ejected by said port mixes with embolic material and follows the

catheter body in a retrograde direction, transporting the fluid and embolic material into

said sheath lumen where it is collected at a second rate not directly metered by said

first injection rate.

24. The catheter system of claim 23 wherein said catheter distal end is located within

said sheath lumen.

25. The catheter system of claim 23 wherein said catheter distal end is located outside

said sheath lumen.

26. A method of using a catheter system to remove material comprising:

advancing a sheath having a sheath lumen to a location near material to be removed;  
advancing a catheter of the type having a fluid port to eject fluid thus creating a  
retrograde flow, through said sheath lumen to a location near material to be removed;  
injecting fluid into said catheter causing fluid to emerge from the catheter,  
entraining material located near said catheter;  
removing said fluid and entrained flow from said sheath lumen.



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PTO/SB/21 (08-00)

Approved for use through 10/31/2002. OMB 0651-0031  
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|  |  | Application Number     | 09/637,529                         |
|  |  | Filing Date            | 08/10/2000                         |
|  |  | First Named Inventor   | Robert C. Beck                     |
|  |  | Group Art Unit         | 3763                               |
|  |  | Examiner Name          | Desanto, M. TECHNOLOGY CENTER R370 |
| Total Number of Pages in This Submission |  | Attorney Docket Number | 2008                               |

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## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

|                         |                         |
|-------------------------|-------------------------|
| Firm or Individual name | Beck & Tysver, P.L.L.C. |
| Signature               |                         |
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